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Urea Feeding Recommendations For Ruminants⁴

FREQUENTLY, the practicing veterinarian is asked questions concerning the feeding of urea. The following is a brief review of urea feeding recommendations for ruminants.

Urea is an inexpensive and valuable substitute for natural proteins in the ration. Urea cannot, however, supply the sole source of nitrogen, because some nitrogen must be supplied by natural proteins. For best weight gains and for safety in feeding, not more than one-third of the protein nitrogen requirement should be provided by urea.

There is 42 percent nitrogen in the feeding grade of urea. It is also known that protein contains 16 percent nitrogen. Therefore, 42×6.25 (protein conversion factor obtained by dividing 100 into 16) gives 262 percent crude protein equivalent. This is where the trade name "Dupont 262" gets its origin. If urea is combined with sufficient carbohydrates, the rumen bacteria will theoretically synthesize 2.62 pounds of protein from each one pound of urea fed. It has been said that 5-6 parts grain and 1 part urea will replace 5-6 parts of 44 percent protein supplement such as soybean oil meal.

As stated above, one-third of the total protein nitrogen can be supplied by urea. If one assumes that a steer will consume 20 pounds of feed per day, averaging 8 percent protein, then we are feeding 1.6 pounds of protein. One-third of this amount or 0.53 pounds of protein nitrogen can be supplied by urea. Dividing 0.53 by 2.62 gives 0.22 pounds, which is the maximum amount of urea that can safely be fed daily to steers in this case on a full corn ration.

Another method used to arrive at the total amount of urea that can safely be fed, is to allow 1 percent of the total daily ration, based on 90 percent dry matter, to be supplied by urea. For example, a steer consuming 20 pounds of total ration could be allowed 0.20 pounds of urea per day.

A protein supplement containing urea

is often fed. Where urea is included, most supplements contain from 3-5 percent. If a protein supplement is 34 percent protein, and the feed tag states that this includes 7.86 percent non-protein nitrogen (urea), then it is a simple matter to compute the percent of urea in the supplement. By dividing 7.86 by 2.62 it is found that the supplement contains 3 percent urea. Therefore, each 100 pounds of supplement contains 3 pounds of urea and each pound of supplement contains 0.03 pounds of urea. If a steer eats 2 pounds of supplement a day, it will be getting 0.06 pound total urea, which is a safe level of feed.

Five points should be stressed when advising livestock owners on the use of urea:

1. Not more than $\frac{1}{3}$ of the total protein nitrogen should be supplied by urea.
2. Cattle fed urea should receive a good source of energy, preferably from grain.
3. A good quality roughage should be included in the daily ration. [at least 0.8 pound per 100 pounds body weight (2)]
4. Mix the urea well in the ration or protein supplement. If urea is fed, it will probably be wisest to have the feed mixed at a local mill or to purchase a supplement containing 3-5 percent urea.
5. Bring the cattle onto urea feed gradually to allow rumen bacteria to "adapt" to utilization of urea.

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